REMARKS/ARGUMENTS

By this Amendment, new claims 37, 38 are identified as new. By the Amendment of April 4, 2008, the specification was amended, claims 8, 12 and 29-36 were canceled, claims 1, 23 and 25 were amended and claims 37 and 38 were added. Claims 1-3, 5-6, 9-11, 13-28, 37 and 38 are pending.

Specifically, in response to the October 20, 2008 Notice of Non Compliant Amendment, claims 37, 38 are now identified as new. Accordingly, the Applicants submit that Supplemental Supplemental is compliant and request that the Supplemental Amendment be entered.

Favorable reconsideration is respectfully requested in view of the foregoing amendments and the following remarks.

The Examiner sets forth that Claim 8 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. According to the Examiner the claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. As to claim 8, the Examiner believes that Applicants, in invention's disclosure, fail to disclose how the maximum likelihood criterion is determined from the Euclidian distance between the received signal, the scatterer coefficients and the signal data demodulated in the receiver, in a way to enable one skilled in the art to use the same method.

Claim 8 is canceled.

The Examiner sets forth that Claims 1 and 3, are rejected under 35 U.S.C. 103(a) as being

unpatentable over Wang et al. ("Generation of scattering functions by computer simulation for mobile communication channels", Vehicular Technology Conference, 1996. 'Mobile Technology for the Human Race'. IEEE 46th; Publication Date: 28 Apr-1 May 1996, Volume: 3, On page(s):1443-1447 vol.3.), and Wiedeman et al. (hereafter, referred as Wiedeman) (US 5,796,760), further in view of Chabah et al. (hereafter, referred as Chabah) (US 6,310,575).

As to claim 1, the Examiner sets forth that Wang discloses a data signal transmitted via a time-variant channel to a receiver (the Examiner directs the Applicant's attention to page 1443), wherein scatter coefficients including attenuation (the Examiner directs the Applicant's attention to page 1444, left column), delay and Doppler frequency (the Examiner directs the Applicant's attention to page 1444, right column) in the received data signal, which cause signal distortion in the channel, are measured in the receiver (the Examiner directs the Applicant's attention to pages 1443 and 1444). According to the Examiner although Wang does not disclose that the signal is transmitted using a single-carrier or multi-carrier, in order to transmit the signals from transmitter to the receiver, inherently, there must be at least one carrier (single carrier). The Examiner believes that Wang discloses all the subject matters claimed in claim 1, except that the data signal is equalized with the scatterer coefficients and then demodulated with them, and that Wang also does not disclose that the scatterer coefficients are measured via a maximum likelihood criterion. As to the first limitation, the Examiner believes that Wiedeman discloses a receiver apparatus comprising an equalizer and a demodulator, wherein the equalizer equalizes a Doppler frequency offset (interpreted by the Examiner as the first scatterer coefficient) for each correlated signal and the delay (interpreted by the Examiner as the second scatterer coefficient) of each of the correlated signals (the Examiner directs the Applicant's attention to column 15,

last paragraph).

The Examiner further believes that Wiedeman further discloses that the receiver includes circuitry for combining together all equalized correlated signals to provide a demodulator with a composite received signal (the Examiner directs the Applicant's attention to column 15, last paragraph). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang as suggested by Wiedeman in order to transmit the majority of the signal over the communication path (or paths) which are capable of conveying a highest quality signal (the Examiner directs the Applicant's attention to column 16, first paragraph) and as the result increases the performance of the receiver. Wang and Wiedeman disclose all the subject matters claimed in claim 1, except that the scatterer coefficients are measured via a maximum likelihood criterion. The Examiner believes that Chabah discloses a method for estimating Doppler frequency (the Examiner directs the Applicant's attention to column 4, lines 37-43), and that Chabah further discloses that the Doppler frequency (interpreted by the Examiner as Scatterer coefficients) is estimated for each candidate according to the known criterion of generalized maximum likelihood. According to the Examiner it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang and Wiedeman as suggested by Chabah to provide a fast and accurate estimation for Doppler frequency.

As to claim 3, the Examiner sets forth that Wang does not expressly disclose that the measurements have been taken place in the context of single-carrier data transmission schemes. However, the Examiner further sets forth that in order to transmit the signals from transmitter to the receiver, inherently; there must be at least one carrier (single carrier).

The Examiner further sets forth that Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Wiedeman, and Chabah further in view of Borowski (US 3,997,841).

As to claim 2, the Examiner sets forth that Wang discloses that the measurement of the scatterer coefficients has been taken place in the time domain (the Examiner directs the Applicant's attention to the abstract and page 1443, right column). Wang, Wiedeman, and Chabah disclose all the subject matters claimed in claim 2, except that the equalization of the data signal takes place within the time domain. The Examiner believes that Borowski discloses that the advantages of the time-domain equalizers are that sufficient noise suppression can be achieved, which permits the use of a low-noise amplifier with sufficient control range (the Examiner directs the Applicant's attention to column 1, paragraph 4), and that therefore, for the reasons stated above, the Examiner believes that it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang, Wiedeman, and Chabah to use a time domain equalizer to equalize the data signal.

The Examiner further sets forth that Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Wiedeman, and Chabah further in view of Schenk et al (hereafter, referred as Schenk) (US 6,647,076).

As to claim 5, the Examiner believes that Wang discloses that the measurement of the scatterer coefficients has taken place in the frequency domain (the Examiner directs the Applicant's attention to the abstract and page 1443, right column), and that Wang, Wiedeman, and Chabah disclose all the subject matters claimed in claim 5, except that the equalization of the data signal takes place within the frequency domain. The Examiner further believes that Schenk discloses that a frequency domain equalizer is used for the channel equalization of a signal

vector (the Examiner directs the Applicant's attention to column Q, lines 35-40). The Examiner believes that Schenk discloses that the frequency domain equalizers require a smaller outlay on circuitry than time domain equalizers and can be implemented as a simple and fast algorithm and as a simple circuit (the Examiner directs the Applicant's attention to column 2). Therefore, the Examiner believes that for the reasons stated above, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang, Wiedeman, and Chabah to use a frequency domain equalizer to equalize the data signal.

The Examiner further sets forth that Claim 6 is rejected under 35 U.S.C. 1 03(a) as being unpatentable over Wang, Wiedeman, Chabah, and Schenk, further in view of Schafhuber et al. (hereafter, referred to as Schafhuber) (Adaptive prediction of time-varying channels for coded OFDM systems Schafhuber, D.; Matz, G.; Hlawatsch, F.; Acoustics, Speech, and Signal Processing, 2002. Proceedings. (ICASSP '02). IEEE International Conference on Volume 3, 13-17 May 2002 Page(s):III-2549 - III-2552 vol. 3).

As to claim 6, the Examiner sets forth that Wang, Wiedeman, Chabah, and Schenk disclose all the subject matters claimed in claim 6, except that the measurements of the scatterer - coefficients and the equalization of the data signal is in the context of multi-carrier data transmission schemes and that Schafhuber, in the same field of endeavor, teaches determining a scattering function (the Examiner directs the Applicant's attention to page 2549, right paragraph), and therefore inherently the scatterer coefficients, and the equalization of the data signal (the Examiner directs the Applicant's attention to Fig. 2) in the context of multi carrier data transmission schemes (i.e. the OFDM) (the Examiner directs the Applicant's attention to page 2549). According to the Examiner it would have been obvious to one of ordinary skill in the

art at the time of the invention to use the teachings of Wang, Wiedeman, Chabah, and Schenk, to make the system disclosed by Schafhuber more simple and cost effective.

The Examiner further sets forth that Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Wiedeman, and Chabah, further in view of Ratnarajah et al. (hereafter, referred as Ratnarajah) (US 6,757,339).

As to claim 9, the Examiner sets forth that Wang, Wiedeman, and Chabah disclose all the subject matters claimed in claim 1, except that a first measurement of the scatterer coefficients is implemented with the assistance of a known data sequence and that Ratnarajah discloses a method for estimating the sequence of transmitted symbols in a digital communication system (the Examiner directs the Applicant's attention to the abstract). The Examiner believes that Ratnarajah discloses that the channel impulse response coefficients (i.e. interpreted by the Examiner as scatterer coefficients) are determined from training symbols embedded in the transmitted data sequence (the Examiner directs the Applicant's attention to column 1, lines 37-49). The Examiner further believes that it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang, Wiedeman, and Chabah as suggested by Ratnarajah, to more accurately determine the coefficients.

The Examiner further sets forth that Claims 10 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Wiedeman, and Chabah, further in view of Smee et al. (hereafter, referred as Smee) (US 2003/0078025).

As to claim 10, the Examiner sets forth that Wang, Wiedeman, and Chabah disclose all the subject matters claimed in claim 1, except that the first measurement of the scatterer coefficients is implemented block-wise over an entire data sequence and that Smee discloses a

method (the Examiner directs the Applicant's attention to Figs. 3 and 4) wherein the Doppler frequency (interpreted as scatterer coefficient) is measured in operation 304 with each frame of received data (the Examiner directs the Applicant's attention to paragraph 0052) (i.e. interpreted by the Examiner as block-wise). According to the Examiner, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang, Wiedeman, and Chabah as suggested by Smee to increase the performance of the equalizer.

As to claim 27, the Examiner sets forth that Wang, Wiedeman, and Chabah disclose all the subject matters claimed in claim 1, except that the first measurement of scatterer coefficients is implemented with unknown useful data sequences and that Smee discloses that the first measurement of scatterer coefficients is implemented with unknown useful data sequences, and that default values are used in the initialization of the algorithm instead of the training and synchronization sequences (the Examiner directs the Applicant's attention to paragraph 0052 and Fig. 3). According to the Examiner it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang, Wiedeman, and Chabah as suggested by Smee to increase the performance of the equalizer.

The Examiner further sets forth that Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Wiedeman, and Chabah, further in view of Kumar (US 4,959,656).

As to claim 11, the Examiner sets forth that Wang, Wiedeman, and Chabah disclose all the subject matters claimed in claim 1, except that a kalman algorithm is used iteratively for the measurement of the scatterer coefficients and that Kumar discloses a method for detecting data and estimating the parameters of a received carrier signal (the Examiner directs the Applicant's attention to column 4, last paragraph). The Examiner believes that Kumar further discloses that

"pseudo" estimates over different bit intervals are combined by a Kalman filter to provide tracking of Doppler frequency (the Examiner directs the Applicant's attention to column 3, first paragraph). According to the Examiner it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang, Wiedeman, and Chabah as suggested by Kumar to improve the system due to better linearization as in iterated Kalman filtering (the Examiner directs the Applicant's attention to column 5, lines 56-60).

The Examiner sets forth that Claims 29, 31, 33, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang and Wiedeman, further in view of Smee.

As to claim 29, the Examiner sets forth that Wang discloses a data signal transmitted via a time-variant channel to a receiver (the Examiner directs the Applicant's attention to page 1443), wherein scatter coefficients including attenuation (the Examiner directs the Applicant's attention to page 1444, left column), delay and Doppler frequency (the Examiner directs the Applicant's attention to page 1444, right column) in the received data signal, which cause signal distortion in the channel, are measured in the receiver (the Examiner directs the Applicant's attention to pages 1443 and 1444). The Examiner believes that although Wang does not disclose that the signal is transmitted using a single-carrier or multi-carrier, in order to transmit the signals from transmitter to the receiver, the Examiner believes that inherently, there must be at least one carrier (single carrier). The Examiner further believes that Wang discloses all the subject matters claimed in claim 29, except that the data signal is equalized with the scatterer coefficients and then demodulated with them.

According to the Examiner Wiedeman discloses a receiver apparatus comprising an equalizer and a demodulator, wherein the equalizer equalizes a Doppler frequency offset

(interpreted by the Examiner as the first scatterer coefficient) for each correlated signal and the delay (interpreted by the Examiner as the second scatterer coefficient) of each of the correlated signals (the Examiner directs the Applicant's attention to column 15, last paragraph). According to the Examiner Wiedeman further discloses that the receiver includes circuitry for combining together all equalized correlated signals to provide a demodulator with a composite received signal (the Examiner directs the Applicant's attention to column 15, last paragraph). The Examiner also believes that it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang as suggested by Wiedeman in order to transmit the majority of the signal over the communication path (or paths) which are capable of conveying a highest quality signal (the Examiner directs the Applicant's attention to column 16, first paragraph) and as the result increase the performance of the receiver.

According to the Examiner Wang and Wiedeman disclose all the subject matters claimed in claim 29, except that the first measurement of the scatterer coefficients is implemented block-wise over an entire data sequence and Smee discloses a method (the Examiner directs the Applicant's attention to Figs. 3 and 4) wherein the Doppler frequency (interpreted by the Examiner as scatterer coefficient) is measured in operation 304 with each frame of received data (the Examiner directs the Applicant's attention to paragraph 0052) (i.e. interpreted as block-wise). According to the Examiner it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang and Wiedeman as suggested by Smee to increase the performance of the equalizer.

As to claim 31, the Examiner sets forth that Wang does not expressly disclose that the measurements have taken place in the context of single-carrier data transmission schemes.

However, according to the Examiner in order to transmit the signals from transmitter to the receiver, inherently, there must be at least one carrier (single carrier).

As to claim 33, the Examiner sets forth that Wang discloses a data signal transmitted via a time-variant channel to a receiver (the Examiner directs the Applicant's attention to page 1443), wherein scatter coefficients including attenuation (the Examiner directs the Applicant's attention to page 1444, left column), delay and Doppler frequency (the Examiner directs the Applicant's attention to page 1444, right column) in the received data signal, which cause signal distortion in the channel, are measured in the receiver (the Examiner directs the Applicant's attention to pages 1443 and 1444), according to the Examiner although Wang does not disclose that the signal is transmitted using a single-carrier or multi-carrier, in order to transmit the signals from transmitter to the receiver, inherently, there must be at least one carrier (single carrier) and Wang discloses all the subject matters claimed in claim 33, except that the data signal is equalized with the scatterer coefficients and then demodulated with them.

The Examiner believes that Wiedeman discloses a receiver apparatus comprising an equalizer and a demodulator, wherein the equalizer equalizes a Doppler frequency offset (interpreted According to the Examiner as the first scatterer coefficient) for each correlated signal and the delay (interpreted according to the Examiner as the second scatterer coefficient) of each of the correlated signals (the Examiner directs the Applicant's attention to column 15, last paragraph). The Examiner believes that Wiedeman further discloses that the receiver includes circuitry for combining together all equalized correlated signals to provide a demodulator with a composite received signal (the Examiner directs the Applicant's attention to column 15, last paragraph). According to the Examiner, it would have been obvious to one of ordinary skill in

the art at the time of the invention to modify Wang as suggested by Wiedeman in order to transmit the majority of the signal over the communication path (or paths) which are capable of conveying a highest quality signal (the Examiner directs the Applicant's attention to column 16, first paragraph) and as the result increase the performance of the receiver according to the Examiner.

The Examiner believes that Wang and Wiedeman disclose all the subject matters claimed in claim 33, except that the first measurement of scatterer coefficients is implemented with unknown useful data sequences and that Smee discloses that the first measurement of scatterer coefficients is implemented with unknown useful data sequences, and that default values are used in the initialization of the algorithm instead of the training and synchronization sequences (the Examiner directs the Applicant's attention to paragraph 0052 and Fig. 3). The Examiner further believes it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang and Wiedeman as suggested by Smee to increase the performance of the equalizer.

As to claim 35, the Examiner sets forth that Wang does not expressly disclose that the measurements have taken place in the context of single-carrier data transmission schemes. However, the Examiner believes that in order to transmit the signals from transmitter to the receiver, inherently, there must be at least one carrier (single carrier).

The Examiner further sets forth that Claims 30 and 34 are rejected under 35 U.S, C. 103(a) as being unpatentable over Wang, Wiedeman, and Smee further in view of Borowski (US 3,997,841).

As to claims 30 and 34, the Examiner sets forth that Wang discloses that the measurement of the scatterer coefficients has taken place in the time domain (the Examiner directs the Applicant's attention to the abstract and page 1443, right column) and that Wang, Wiedeman, and Smee disclose all the subject matters claimed in claims 30 and 34, except that the equalization of the data signal takes place within the time domain. The Examiner further sets forth that Borowski discloses that the advantages of the time-domain equalizers are that sufficient noise suppression can be achieved, which permits the use of a low-noise amplifier with sufficient control range (the Examiner directs the Applicant's attention to column 1, paragraph 4) and that therefore, for the reasons stated above, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Wang, Wiedeman, and Smee to use a time domain equalizer to equalize the data signal.

The Examiner sets forth that Claims 32 and 36 are rejected under 35 U.S,C. 103(a) as being unpatentable over Wang, Wiedeman, Smee, Borowski, and Schafhuber, further in view of Ratnarajah et al. (hereafter, referred as Ratnarajah) (US 6;757,339),

As to claims 32 and 36, the Examiner sets forth that Wang, Wiedeman, Smee, and Borowski disclose all the subject matters claimed in claims 32 and 36, except that the measurements of the scatterer-coefficients and the equalization of the data signal is in the context of multi carrier data transmission schemes and that Schafhuber, in the same field of endeavor, teaches determining a scattering function (the Examiner directs the Applicant's attention to page 2549, right paragraph), and therefore inherently the scatterer-coefficients, and the equalization of the data signal (the Examiner directs the Applicant's attention to Fig. 2) in the context of multi-carrier data transmission schemes (i.e. the OFDM) (the Examiner directs the Applicant's

attention to page 2549). The Examiner believes that it would have been obvious to one of ordinary skill in the art at the time of invention to use the teachings of Wang, Wiedeman, Smee, and Borowski, to make the system disclosed by Schafhuber more simple and cost effective. The Examiner further believes that Wang, Wiedeman, Smee, and Borowski also do not disclose that a first measurement of the scatterer coefficients is implemented with the assistance of a known data sequence and Ratnarajah discloses a method for estimating the sequence of transmitted symbols in a digital communication system (the Examiner directs the Applicant's attention to the abstract). Ratnarajah discloses that the channel impulse response coefficients (i.e. interpreted by the Examiner as scatterer coefficients) are determined from training symbols embedded in the transmitted data sequence (the Examiner directs the Applicant's attention to column 1, lines 37-49). According to the Examiner, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wang, Wiedeman, Smee, Borowski, and Schafhuber as suggested by Ratnarajah, to more accurately determine the coefficients.

The Examiner further sets forth that Claims 12-26 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Examiner has indicated that claims 12, 14 and 28 include patentable subject matter. Accordingly, claim 1 has been rewritten to include the limitations of claims 1 and 12, new claim 37 includes all of the limitations of claims 1 and 14, and new claim 38 includes all of the limitations of claims 1 and 28. Thus, claims 1, 37 and 38 include patentable subject matter. The remaining claims depend from patentable claim 1 and are therefore patentable for the same reasons.

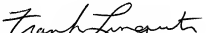
For at least the reasons set forth above, it is respectfully submitted that the above-identified application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are respectfully requested.

Should the Examiner believe that anything further is desirable in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

CAESAR, RIVISE, BERNSTEIN,
COHEN & POKOTILOW, LTD.

October 21, 2008

By 
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